TECHNIQUE OF CATARACT EXTRACTION DURING NARCOSIS*

BY

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Operations on the interior of the adult eye are performed with the patient awake, particularly in the case of cataract extraction. This is because with the usual operative technique the co-operation of the patient is necessary to supplement the control of the position of the eye, and the congestion, vomiting, and other disturbances commonly associated with general anaesthesia entail risks to the eye. The mental strain on the average elderly person of consciously submitting to a cataract operation is considerably more than is realized. Medical thought is accustomed to the use of local anaesthesia, the patient remaining fully conscious, and to the extreme degree of unconsciousness of general anaesthesia. But attention has not been given to the attainment of a less extreme state of somnolence, in which, besides being given the usual local injection of novocain, the patient may also be put to sleep to a degree sufficient to abolish all consciousness of the proceedings. "Surgical narcosis" might be a suitable name for such an intermediate state.

The purpose of this article is to describe, first, a routine technique—which I have employed for a long time—for rendering the patient quietly unconscious during operations on the interior of the eye. The state of sleep lasts for some seven to fourteen hours after operation—a period in which pain is commonly experienced after the effect of the usual local anaesthetic has disappeared. The patients wake up as from a long normal sleep, with no pain in the eye and seldom with any unpleasant general sensations. Secondly, I propose to describe briefly a modification of the operative technique of cataract extraction, which meets these conditions of narcosis, adds safety to the orthodox method, and has the advantage that the patient can safely be propped up in bed on the next day and can sit out of bed usually on the third day instead of staying in bed for the customary seven days.

Elderly persons, especially women, after cataract operations may experience serious symptoms such as vomiting, flatulence, abdominal pain, and constipation, which are usually attributed to the absence of peristalsis due to lying on the back for many days. Delirium may follow cataract extraction done with the patient awake, as may urinary retention. If patients who have not had cataract operations lie flat for days they do not get the same, if any, distressing symptoms. In my experience these symptoms do not ensue if "surgical narcosis" has been employed, and it can therefore reasonably be suggested that they are connected with "mental shock" consequent on operations done on the eyes of elderly persons while conscious.

Orthodox Technique

The most important point in cataract extraction is that the surgeon should leave the face of the vitreous fluid intact. Even if the patient has reasonably good vision afterwards any loss of vitreous during or after the operation is a grave surgical disaster, due practically always to faulty technique. Prolapse of the iris is the most feared post-operative complication, since it necessitates a further and risky operation on a sensitive eye. The first case of prolapsed iris that I had in private practice was due to delirium coming on the day after extraction of the cataract. The patient in her violence ruptured the face

of the vitreous, of which much escaped. This case turned my attention to devising methods of increased safety.

When the incision is made in cataract extraction the eye is usually steadied by fixation forceps which grip the friable conjunctiva either at W (Fig. 1) or at X, or at some point between. In either case the active co-operation of the patient is needed to control the eye and prevent the movement of the knife rolling it sideways if the grip is at W, or rolling it upwards if the grip is at X. Some operators insert a length of silk (R, Fig. 3) in the tendon of the superior rectus; this stabilizes the eye to some extent, but not adequately by itself. In the customary procedure the "puncture" (P, Fig. 1) and counter-puncture (P') are outside the limbus (L). The knife (K, Fig. 1) makes a "peripheral" incision cutting out close to the base of the iris so as to create a conjunctival flap (C, Fig. 2) beneath which the incision eventually heals. The

FIG. 1.

FIG. 2.

peripheral position of the incision predisposes to prolapse of the iris, which is not prevented even if the conjunctiva is sutured, as is occasionally done. I prefer to make the incision mainly on the corneal side of the limbus away from the base of the iris.

Surgical Narcosis

In 1934 I used various recognized agents, including bromide and chloral hydrate and rectal paraldehyde; nembutal causes restlessness in some patients. In 1935, after consultation with Dr. R. J. Clausen, Dr. Maitland Scott, and Mr. L. Broster, I decided that rectal paraldehyde was reasonably satisfactory. Later I combined with this a hypodermic injection of omnopon, and the result was excellent. The amount of paraldehyde given—one drachm being dissolved in ten drachms of saline—is three-quarters to one drachm for each stone of the patient's weight, and the dose of omnopon should be one-thirtieth of a grain for every stone (*vide*:—Section of Anaesthetics of the Royal Society of Medicine: "Preliminary Medication in Anaesthetics," December 7, 1928; also "Pre-medication," *Journal*, October 17, 1931, p. 693, both by Stanley Rowbotham). Bromide is given by mouth in the preceding twenty-four hours. The paraldehyde is given by the rectum an hour before the operation; the omnopon is injected about half an hour before the operation. About three-quarters of an hour before operation some biniodide of mercury ("cusi") ointment is placed beneath the eyelids. At the same time two small cotton-wool swabs, soaked respectively in 2 per cent. homatropine and adrenaline 1 in 1,000 (to produce full dilatation of the pupil) are inserted beneath the upper eyelid. The swabs and the ointment are renewed a quarter of an hour before operation, with an additional swab soaked in 1 per cent. cocaine. (I omit here the description of certain customary novocain and adrenaline injections of the eyelids, etc., besides nursing details of the preliminary preparation for narcosis, which is simple.) If less paraldehyde and omnopon is given, so that deep narcosis is not attained, then, despite semi-consciousness,

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the patients afterwards deny having any memory of the operation.

Many of my cases have been dealt with in the nursing home of Sister E. E. Hughes, and Sister A. Bryant, formerly staff-nurse to the eye department of St. Bartholomew's Hospital. They have been impressed by the absence of post-operative mental and other distress in cases operated on under "surgical narcosis"—an opinion more convincing when expressed by the nursing staff than by a surgeon who visits the patients only briefly.

Modified Technique of Operation

The patient being soundly asleep, the conjunctiva is incised along WX (Fig. 3) and is retracted to GH. The

cover of the tunnel, T, with a pair of fine-pointed forceps (F, Figs. 6, 7, 8).

The knife, which has been dipped in hot vaseline, is passed slowly upwards behind the corneal stitch (Figs. 6, 7, 8) and, after a deliberate pause to select the site, is slowly brought out between this stitch (D, Fig. 7) and the tunnel, T. One end of the corneal suture is then threaded through the tunnel (Fig. 9). Alternatively, the needle (N, Fig. 10) can have been placed in the tunnel before the incision is made, after which it is drawn completely through. (If it is drawn right through before this there is risk of cutting the stitch as the knife emerges.) By pulling on the parts A and B of this thread (Fig. 9)

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

FIG. 8.

FIG. 9.

FIG. 10.

steadying suture, R, is then inserted in the superior rectus tendon. With a "broad needle" (N, Fig. 3) I then pierce a small tunnel, T, in the surface of the "cleaned" sclera. Perforation of the sclera has been done daily for decades in inserting the stitches in operations for squint. This tunnel, instead of being horizontal, may be vertical (T', Fig. 4), a special broad needle (bent on the flat at K) being used. In the drawings here reproduced the tunnel has been drawn arbitrarily either vertical or horizontal. The relative merits of each cannot be described here; on the whole the vertical (Fig. 4) is preferable.

One of two fine needles (Fig. 5) on a piece of Wiess's finest black silk is then inserted through the middle layers of the cornea without penetrating to the interior of the eye. The precise manner of inserting this corneal suture in relation to the tunnel, T, depends on the way chosen to tie it at the end of the operation. The assistant then holds the steadying superior rectus stitch (R, Fig. 3) with one hand and this fine corneal stitch with the other. In making the incision to open the eye the operator secures an absolute yet most delicately variable control of the eye—from what is mechanically the correct point of application—by gripping the edge of the

the incised upper part of the cornea is lifted up like the lid of a box, a piece of the lens capsule is removed with capsule forceps, and the cataractous nucleus is tilted forward and upward by the lightest of pressure on the lower part of the cornea and is then picked out on the point of a cystitome.

FIG. 11.

The dilated iris is not touched throughout the operation; no iridectomy is needed. The fine suture is then pulled fully through the tunnel and tied, after which it is passed through the conjunctiva and tied again. Fig. 9, in which the conjunctiva is omitted, shows sectionally how the suture does not enter the interior of the eye. Drops of atropine, 1 per cent., and argyrol, 15 per cent., are finally instilled.

The patient sleeps on for seven to fourteen hours and sits up in bed the next day, rested and free from pain, and usually can sit out of bed on the third day instead of the customary seventh. In trephining for glaucoma I put the patient to sleep in a

similar way. The superior rectus stitch gives adequate steadying of the globe in trephining, and abolishes any need of the patient's co-operation.

Conclusion

I have given the procedures mentioned here a long and detailed trial. They will be described more fully in a publication I have in preparation. I think that eventually the custom of patients walking into an operating theatre and consciously co-operating in the performance of an operation on their own eye may come to be regarded as anomalous. Apart from the absence of discomfort and distress in the days following the operation, and the benefit to the patient of being asleep during it, the advantage it affords to the operator is such that I believe no operator who had accustomed himself to the method I have described would care to resume cataract-extraction, or glaucoma-trephining, on patients when they were not thus asleep. Nervous patients can be kept asleep for still longer by the administration of more hypnotics later. The eye is the only transparent part of the surface of the body. After an operation for cataract, expert examination can at any time during the rest of the patient's life provide an accurate estimate of the competence of the technique employed by any operator. It follows that theoretical objections to innovations can always be met with the proposal that all cases be submitted after operation to impartial expert examination.

Clinical Memoranda

Bilateral Spontaneous Pneumothorax

In view of the article by Dr. R. A. Young (1936) in the *British Medical Journal*, and a further communication by Herbert L. Settle (1936), it is hoped that the following case will be of interest. Although I did not see this patient the full notes were passed to me for perusal, and from them the following extract was made.

At Jerusalem Sergeant B, aged 34, a quiet, temperate, and apparently healthy young man, rose from his bed before réveillé on November 11, 1936, and complained to his comrades of a pain "below the chest." He then went for a short walk, and on his return said he felt better. He ate a usual breakfast, but at 8.30 a.m. he went back to the sergeants' mess and ordered a lemonade, which he drank quickly, saying afterwards, "That's better." Later in the morning, while in the orderly room, he suddenly fell face forward to the ground. He was removed to hospital immediately, but on examination was found to be dead. Prior to this catastrophe there had been no undue strain from laughing, coughing, sneezing, shouting orders, or from exercise such as running or mounting stairs. There was no history of injury to the chest wall. At the post-mortem examination both lungs were found to be completely collapsed. The lungs were of normal texture, and there was no macroscopic evidence of tuberculous, neoplastic, or other disease. The pleural surfaces were normal in appearance over the whole of the lungs and chest wall. The pleural cavities contained no exudate. There was no evidence of an opening on the lung surfaces when water from a tap was forced through the main bronchi. The heart was in diastole, with well-developed and normal muscle. In the pericardial cavity there was no excess of fluid and no sign of inflammation. The brain and abdominal viscera appeared healthy and free from tuberculosis. The cause of this sergeant's sudden decease was considered to be due to spontaneous bilateral pneumothorax.

This case appears, therefore, to belong to the class described by Dr. Young in his paper as pneumothorax in the apparently healthy, or pneumothorax simplex.

From the history it is most probable that it was the occurrence of a sudden pneumothorax on one side which caused him to wake up before réveillé complaining of "pain below the chest," by which he meant, presumably, the upper abdomen. Settle's patient, too, complained of pain in the same region. That the soldier did not feel quite comfortable from that time until 8.30 a.m. is evidenced by his return to the sergeants' mess for a drink; and, from what he said, the fizz of the lemonade temporarily eased his discomfort. It is further presumed that somewhat later, when he was in the orderly room, pneumothorax occurred on the other side, thus causing the inevitable and immediately fatal result.

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Case of Herpes Zoster with Facial Paralysis

The association of common facial palsy with herpes zoster of the neck is rare, and is of interest in view of the controversy regarding the causative organism and its mode of transmission in the latter disease.

The patient, a rather anaemic male aged 62, complained on April 8 of pain in the left occipital region, below the ear, and over the sternomastoid area of the left side of the neck. The pain continued for three days, and was described as being like a neuralgia. He had been employed as a night watchman on a road-building scheme, being exposed for hours at a stretch to cold winds. Three days later an erythema appeared on the left side of the neck, and on examination some hours after I found a typical vesicular rash of herpes zoster over the sternomastoid region on the left side, together with some adenitis in the posterior triangle. The cutaneous area affected by the vesicles suggested involvement of the second cervical nerve.

On the following morning I saw him again. He was now tender below the left ramus of the jaw, and complained of his left eye "running." Examination of the face showed evidence of a left-sided common facial palsy with the mouth drawn to the right side, inability to close the left eye, epiphora, and escape of fluid after drinking from the left corner of the mouth. No other cranial nerve was found to be affected. His temperature was 99.2° F., and pulse 88. With warmth and rest in bed the facial palsy soon improved, and, with the herpes, had disappeared in a fortnight.

The organism responsible for herpes zoster is a filterable virus, the infection passing outwards along the sensory nerve from the corresponding posterior root ganglion. Degenerative changes may spread upwards into the posterior columns of the cord and downwards along the peripheral nerves. On rare occasions the infection has spread horizontally in the spinal cord from the posterior to the anterior horn, resulting in a motor paralysis. The temporary paralysis of the seventh cranial nerve may be explained in this way, the only other solution occurring to me being that the two simultaneous conditions of palsy and herpes were separate entities, the cold winds acting as a common exciting factor.

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